

## Nonnative Grass Invasions and Fire in the Mojave Desert

Fires in the Mojave Desert appear to have been infrequent historically. When fires did occur, gaps of plant-free space separating individual shrubs, bunchgrasses, cacti, and trees, stopped the spread of fires like networks of small firebreaks.

Since the 1970s, though, nonnative grasses have invaded the desert and become increasingly dominant in native plant communities. The increasing dominance of these grasses and a burgeoning human population in the Mojave Desert have led to more fires, which threaten native perennial plants that are poorly adapted to survive the increasing frequency and intensity of these fires.

Recent USGS studies have shown that nonnative annual grasses in the genera *Bromus* and *Schismus* now dominate most plant communities in the Mojave Desert. Unlike most native annual plants, which specialize in particular microhabitats, these grasses grow in many different situations and can create continuous fuel beds across the landscape, filling in the plant-free space that once separated and protected native perennials from fire. And unlike native annuals, which crumble and blow away soon after they die, dried remains of the nonnative grasses stay rooted in highly flammable dense stands for years after they die. They ignite easily and carry fire rapidly and unbrokenly across the landscape.



With repeated burning, invasive grass species can convert a Mojave Desert landscape into a nonnative annual grassland of low diversity and few native plants and animals. Photo: M. Brooks.

### Research is still needed on:

- Ecological effects of fire
- Invasive plant ecology and management
- Relationships between invasive plants and fire
- Fire behavior
- Fuels management
- Spatio-temporal fire hazard models

Many native annuals can survive fires by remaining dormant as seeds in the soil, but they may not successfully compete with the nonnative annual grasses, which dominate postfire landscapes. Wildlife is killed by fire, and those animals that survive may be adversely affected by changes in the structure of their habitat. The invasion of nonnative annual grasses and the increased frequency of fires are changing the face of the Mojave Desert.

Because nonnative plants are difficult to control, preventing their initial establishment may be the best approach to managing them. Based on the limited information currently available, it appears that all wildfires should continue to be suppressed in desert scrub habitats. Studies are in progress by USGS scientists to further evaluate the effects of fire and develop postfire restoration techniques that minimize the dominance of nonnative annual grasses in the Mojave Desert.

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